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10/532,282	10/04/2005	Ewa Kijak	PF020146	8510
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Thomson Licensing LLC P.O. Box 5312 Two Independence Way PRINCETON, NJ 08543-5312			EXAMINER KIM, HEE-YONG	
			ART UNIT 4192	PAPER NUMBER PAPER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/532,282	<b>Applicant(s)</b> KIJAK ET AL.
	<b>Examiner</b> HEE-YONG KIM	<b>Art Unit</b> 4192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 21 April 2005 is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
 

Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)
 

Paper No(s)/Mail Date \_\_\_\_\_
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: the paragraph 14 in the column 2 cites "very good probability" which is indefinite.

Appropriate correction is required.

The disclosure is objected to because of the following informalities: there is an inconsistency of citing the subset "Ik" in the numerous places which is recited "Ik" in the column 2, the paragraph 43 as well.

Appropriate correction is required.

### ***Drawings***

The drawing is objected because the photographs must be of sufficient quality so that all details in the photographs are reproducible in the printed patent.

The informal drawings are not of sufficient quality to permit examination. Accordingly, replacement drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to this Office action. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action.

Applicant is given a TWO MONTH time period to submit new drawings in compliance with 37 CFR 1.81. Extensions of time may be obtained under the provisions of 37 CFR

1.136(a). Failure to timely submit replacement drawing sheets will result in ABANDONMENT of the application.

The photographs in Figure 3 are not acceptable to be examined.

The drawing is objected to because of the following informality: The item 11 in the Fig2 explains determining a subset as the condition "d(i,k) T for c", but it is not intelligible and the examiner assumes "d(I,k1) < T for iε Ik". .

Appropriate correction is required.

#### ***Claim Objections***

Claim 1 is objected to because of the following informalities: it cites very good probability which is indefinite. Appropriate correction is required.

Claim 4 is objected to because of the following informalities: The last sentence is incomplete and ends with comma. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is not clear how Monte Carlo method is specifically used even if the specification discloses the reference ("Robust regression method for computer vision: a review", Rosenfeld).

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

In summary, the claimed methods are not tied to a particular machine or apparatus. Additionally, none of the recited steps transform a particular article into a different state or thing.

Accordingly, the recited method is nonstatutory subject matter.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al. ("Refining Initial Points for K-Means Clustering", Microsoft Research Technical Report, May 1998, pp.3-4) in view of Paul E. Green ("Analyzing Multivariate Data", The Dryden Press, 1978, pp.427-428) and Jain et al. ("Algorithms for Clustering Data", Prentice Hall, 1988, pp.96-101), hereafter referenced as Bradley and Green and Jain respectively.

Regarding claim 1, Bradley discloses *random drawing of p candidates* (Random Subsamples in the Algorithm Refine, page 3) *from the set of key images, p being calculated in such a way as to obtain a very good probability of drawing a key image of a prevalent shot, calculation of the cost C for each candidate* (Distortion in the Algorithm Refine, page 3), *dependent on the distance from the key images of the set to that of the candidate, the distance relating to the signatures, and selection of the candidate (lk) minimizing the cost C* (ArgMin{Distortion} in the Algorithm Refine, page 3). However Bradley fails to disclose *determination of a subset (lk) from among the set of key images such that the key images forming the said subset have a distance from the candidate less than a threshold T, deletion of the key images of the subset (lk) to form a new set of key images for at least one new random draw and determination of a new seed according to the previous 5 steps, and determination of a seed (k2) from among the key images of the subset (lk) such that it minimizes the cost function C for this subset*. However the examiner maintains that it was well known in the art to provide the above as taught by Green and Jain.

In a similar field of endeavor Green discloses *determination of a subset (lk) from among the set of key images such that the key images forming the said subset have a distance from the candidate less than a threshold T* (all object within prespecified threshold are grouped) and *deletion of the key images of the subset (lk) to form a new set of key images*(Once points enter a cluster they are removed from further processing) *for at least one new random draw and determination of a new seed according to the previous 5 steps* (the process is repeated for the process is repeated

for the uncluttered points, and so on), as disclosed in Sequential Threshold at Page 428.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bradley by specifically providing determination of a subset and deletion of the key images of the subset as taught by Green, for the purpose of reduction of computation cost by optimizing sequentially, one seed at a time, instead of optimizing all seeds in parallel.

In a yet another similar field of endeavor Jain discloses *determination of a seed (k2) from among the key images of the subset (lk) such that it minimizes the cost function C for this subset* (compute new cluster centers as the centroids of the clusters) as disclosed in Algorithm For Iterative Partitional Clustering Step 3 at page 97.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bradley and Green by specifically providing *determination of a seed (k2) from among the key images of the subset (lk) such that it minimizes the cost function C for this subset*, as taught by Jain for the purpose of optimizing a centroid from a cluster.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley and Green and Jain in view of Palmer ("Density Biased Sampling: An Improved Method for Data Mining and Clustering", Proceedings of ACM SIGMOD International Conference on Management of Data, 2000), hereafter referenced as BGJ and Palmer.

Regarding claim 3, BGJ discloses everything claimed as applied before (see claim 1), however they fail to disclose *wherein the key images are weighted, as regards*

*their signature, as a function of the length of the shots of the video sequence that they characterize and in that the random draw is biased by the weight of the key images.*

However the examiner maintains that it was well known in the art to provide the above as taught by Palmer.

In a similar field of endeavor Palmer discloses *wherein the key images are weighted, as regards their signature, as a function of the length of the shots of the video sequence that they characterize and in that the random draw is biased by the weight of the key images* ((iii)the sampling is biased by group size, page 3).

Therefore it would have been obvious to one of ordinary person in the art at the time the invention was made to modify BGJ by providing the biased sampling taught by Palmer for the purpose of getting more realistic sampling in the video summary application.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over BGJ in view of Foote (US patent 6,774,917), hereafter referenced as Foote.

Regarding claim 4, BGJ discloses everything claimed as applied before (see claim 1). Bradley further discloses *wherein the cost C is dependent on the quadratic distances* (the sum of squared distances of each data point to nearest means) *between the signature of the candidate and those of the key images of the subset.* However BGJ fails to disclose that *T is the standard deviation of the distribution of the distances of the key images of the set from the candidate.* However the examiner maintains that it was well known in the art to provide *the threshold T as a standard deviation of the*

*distribution of the distances of the key images of the set from the candidate as taught by Foote.*

In a similar field of endeavor Foote discloses Methods and Apparatus for Interactive similarity searching, Retrieval, and Browsing video. Specifically Foote discloses that a multiple of standard deviation is used as threshold(T) in the figure 18 and the column 5, line 36-39.

Therefore it would have been obvious to one of ordinary person in the art at the time the invention was made to modify BGJ by providing the threshold as a standard deviation, as taught by Foote, for the purpose of detecting class membership effectively using statistics.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over BGJ in view of Wan et al. ("A multiresolution color clustering approach to image indexing and retrieval", Proceedings of 1998 IEEE International conference, pp.3705-3708), hereafter referenced as Wan.

Regarding claim 5, BGJ discloses everything claimed as applied before (see claim 1), however they fail to discloses *wherein the signature of an image relates to the dominant color*. However the examiner maintains that it was well known in the art to provide the above as taught by Wan.

In a similar field of endeavor Wan discloses the dominant color as a feature as disclosed in the sub clause 3.1, which is equivalent to signature of an image relates to the dominate color.

Therefore it would have been obvious to one of ordinary person in the art at the time the invention was made to modify BGJ by providing the dominant color as a feature as taught by Wan for the purpose of quickly differentiating clusters at the coarse resolution.

Claim 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over BGJ in view of Vailaya et al.("Video Clustering", Technical Report MSUCPS:TR96-64, Michigan State University, 1996), hereafter referenced as Vailaya.

Regarding claim 6, BGJ discloses everything claimed as applied before (see claim 1). However BGJ fails to disclose *shots of a sequence of video images, the sequence being split into shots , a shot being represented by one or more key images, at least one signature or attribute being calculated for the key images, comprising a phase of partitioning the key images on the basis of a comparison of the attributes of the key images, comprising a phase of initialization for the selection of at least two key images or seeds on the basis of which the comparisons for the grouping are performed.* However the examiner maintains that it was well known in the art to provide the above as taught by Vailaya.

In a similar field of endeavor Vailaya discloses *the sequence being split into shots (shot detection), shot being represented by one or more key images (keyframe extraction), signature or attribute(feature extraction), and comprising a phase of partitioning the key images (clustering) in Figure 1.*

Therefore it would have been obvious to one of ordinary person in the art at the time the invention was made to modify BGJ as taught by Vailaya by providing the shot

detection, key-image extraction, feature extraction, and the clustering for the purpose of video summary or indexing.

Regarding claim 7, BGJ and Vailaya disclose everything as claimed as before (see claim 6). In addition Jain also discloses *wherein the partitioning phase implements an algorithm of the K-means or K-medoid type* (K-means type algorithm at the page 99) by citing that K-means type algorithms converge rapidly.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify BGJ by specifically providing *wherein the partitioning phase implements an algorithm of the K-means or K-medoid type* as taught by Jain, for the purpose of faster convergence of clustering.

Regarding claim 8, BGJ and Vailaya disclose everything as claimed as before (see claim 6). In addition Green also discloses *wherein the initialization and partitioning phases are iteratively repeated* (the process is repeated for the process is repeated for the uncluttered points, and so on), *the key images of the most compact cluster obtained in the previous iteration being eliminated from the set processed at this previous iteration so as to provide a new set on which the new iteration is performed* (Once points enter a cluster they are removed from further processing), as disclosed in Sequential Threshold at Page 428.

Therefore it would have been obvious to one of ordinary person in the art at the time the invention was made to modify BGJ and Vailaya by providing the Sequential Threshold

Method as taught by Green as a partitioning for the purpose of reduction of the computation.

Regarding claim 10, BGJ and Vailaya disclose everything as claimed as before (see claim 6). Also it discloses everything for claim 10 because *Method of selecting shots of interest, these shots being prevalent in the video sequence, characterized in that it implements implementing the method according to Claim 6, the shots of interest corresponding to the grouping performed about the first seed selected* is a part of process disclosed in claim 6.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over BGJ and Vailaya in view of Turi et al. ("K-means Clustering for Colour Image Segmentation with Detection of K", Proceedings of the LASTED international Conference Signal and Image Processing, Oct 27-31, 1998, pp. 345-349), hereafter referenced as Turi.

Regarding claim 9, BGJ and Vailaya disclose everything as claimed as before (see claim 8). However BGJ and Vaiaya fail to disclose *wherein the stopping criterion for the iterations is dependent on the number of key images not belonging to the most compact cluster selected or else is dependent on the averages of the intra-cluster distances*.

However the examiner maintains that it was well known in the art to provide the above as taught by Turi.

In a similar field of endeavor Turi discloses *the stopping criterion dependent on the averages of the intra-cluster distances* (Equation 1 at the page 346).

Therefore it would have been obvious to one of ordinary person in the art at the time the invention was made to modify BGJ and Vailaya by providing the intra-cluster distance as a stopping criterion as taught by Turi for the purpose of compactness of the clusters.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HEE-YONG KIM whose telephone number is (571)270-3669. The examiner can normally be reached on Monday-Thursday, 8:00am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Harold can be reached on 571-272-7519. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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Examiner Hee-Yong Kim

H.K  
/Jefferey F Harold/

Supervisory Patent Examiner, Art Unit 4192